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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/568,279	ALLAN, GORDON JOHN	
	Examiner	Art Unit	
	QUAN TRA	2816	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/11/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to the amendment filed 12/11/07. The allowable subject matters of claims 1-32 have been withdrawn. A new ground of rejection is introduced.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 is indefinite because there is no antecedent basis for the limitation "the control input(s)".

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-12, 17, 18, 20-27, 30-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwamoto (US 20020043996), previously cited, in view of Saeki et al. (JP 57050391).

As to claim 1, Iwamoto's figure 5 shows a shift register, but fails to show the claimed detail. However, Saeki et al.'s figure 4 shows a similar shift register having small occupied area. Therefore, it would have been obvious to one having ordinary skill in the art to use Saeki et al.'s shift register for Iwamoto's shift register for the purpose of saving space. It is noted that

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Iwamoto's first stage 52#1 receives power supply, and last stage 52#n receives ground, Therefore, node 45 of Saeki et al.'s must receives the power supply and node 47 must receives ground. Thus, the modified Iwamoto's figure 5 shows a circuit comprising: a plurality of mixed-signal outputs (outputs of Saeki et al.'s inverters 21 and/or inverters 22); a first set of driving elements (inverters 22) connected together in sequence each having a respective output connected to a respective one of the mixed-signal outputs; the first set of driving elements having a first driving element and having a last driving element; a second set of driving elements (inverters 21) connected together in sequence each having a respective output connected to a respective one of the mixed signal outputs in an order opposite to an order of connection of the first set of driving elements to the mixed signal outputs, the second set of driving elements having a first driving element and a last driving element; wherein while in a first control state (L state) the first set of driving elements drives each of the mixed-signal outputs towards a respective off state sequentially in a direction from the first driving element of the first set towards the last driving element of the first set such that any mixed-signal output that is driven only partially towards its respective off state maintains an analog value (if the output of any one of the inverters 22 is not fully low (partially low) when inverters 22 are at the high impedance states (tri-states), that output value is maintained and considered as the analog value); and wherein while in a second control state (R state) the second set of driving elements drives each of the mixed-signal outputs towards a respective on state sequentially in a direction from the first driving element of the second set towards the last driving element of the second set such that any mixed-signal output that is driven only partially towards its respective on state maintains an analog value (when the inverters 21 are at the high impedance states); wherein while in a third control state (between R and L states) each mixed-signal value maintains its respective value.

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As to claim 2, Saeki et al.'s figure 5 shows two control inputs (L and R) that define the first, second and third control states. :

As to claim 3, Saeki et al.'s figure 5 shows that each driving element is a tri-state buffer (two inverters), and each of the on states are represented by a high voltage, and each of the off states are represented by a low voltage.

As to claim 4, Saeki et al.'s figure 5 shows that each driving element is an inverter, and each of the on states alternate between being represented by a low voltage and a high voltage, and each of the on states alternate between being represented by a high voltage and a low voltage.

As to claim 5, Saeki et al.'s figure 3 shows a logic on biasing circuit (31 and 34 in inverters 21) that biases an on voltage (at node between 31 and 32) of any active high control input to an amount below logic high (because of the threshold of 31) and/or biases any active low control input (at node between 33 and 34) to an amount above logic low (because of the threshold of 34).

As to claim 6, Saeki et al.'s figure 3 shows a logic off biasing circuit (31 and 34 in inverters 22) that biases an off voltage of any active high control input to an amount above logic low and/or biases any active low control input to an amount below logic high.

As to claim 7, Saeki et al.'s figure 3 shows each driving element is a single-transition driving element.

As to claim 8, tunable filter is well known in the art for reducing unwanted noise. It would have been obvious to one having ordinary skill the art add a tunable filter connected between the control input(s) and the driving elements for the purpose of reducing noise.

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As to claim 9, tunable filter is well known in the art for reducing unwanted noise. It would have been obvious to one having ordinary skill in the art add filter connected to each of the mixed-signal outputs for the purpose of reducing the outputs' noises.

As to claim 10, the Iwamoto's figure 4 further shows circuitry (43) to dynamically determine a sub-set of the mixed-signal outputs that include at least those producing analog value outputs.

As to claim 11, the modified Iwamoto's figures 4 and 5 show at least one additional filter (see the rejection of claims 8 and 9); circuitry (Iwamoto's 43) that dynamically connects the at least one additional filter to mixed-signal outputs that are outputting analog values.

As to claim 12, the modified Iwamoto's figures 4 and 5 show that the at least one filter has at least one dynamically adjustable filter characteristic.

As to claim 13, the modified Iwamoto's figures 4 and 5 show circuitry (43) for detecting when a particular mixed-signal output has reached a digital state, and for dynamically securing the particular mixed-signal output to an appropriate reference upon making such a detection.

As to claim 14, Saeki's figure 4 shows circuitry (circuit at generate $\Phi 1$) for maintaining an approximate state of the mixed-signal outputs upon power down or idle modes of the circuit.

As to claim 17, Saeki's figure 4 shows steering logic (42 and 43) for directing signals received on the at least one control input to a subset of the driving elements that are generating analog values

As to claim 18, the modified Iwamoto's figure 4 shows a delay line (42, 43) comprising at least one delay element, wherein each mixed-signal output controls how much delay such elements introduce into the delay line.

As to claim 20, Iwamoto's figure 3 shows a delay locked loop synchronization circuit

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As to claim 21, Iwamoto's figure 3 shows a phase locked loop synchronization circuit.

As to claim 22, Iwamoto's figure 3 shows a clock de-skew circuit.

Claim 23 recite similar limitations of claim 1. Therefore it is rejected for the same reasons.

As to claim 24, the modified Iwamoto's figures 4 and 5 show the step of dynamically determining (by 43) a subset of the set of mixed-signal outputs including at least those that are outputting an analog value.

As to claim 25, the modified Iwamoto's figures 4 and 5 show that the step of dynamically determining which of the set of mixed-signal outputs are outputting an analog value comprises: for each of at least one particular mixed-signal output, receiving at least one neighboring mixed-signal outputs; determining the mixed-signal output is analog if the neighboring mixed-signal output(s) are consistent with the particular mixed-signal output being analog value for a mixed-signal thermometer code (any code).

As to claim 26, the modified Iwamoto's figures 4 and 5 show the step of dynamically connecting at least one additional filter to the mixed-signal outputs (see the rejection of claims 8 and 9) that are outputting analog values.

As to claim 27, the modified Iwamoto's figures 4 and 5 show the step of maintaining (in the tri-state) a respective state for each of the mixed-signal outputs that are outputting analog values.

Claims 30-32 recite similar limitations of claims above. Therefore, they are rejected for the same reasons.

As to claim 33, the modified Iwamoto's figures 4 and 5 show a circuit comprising: at least one control input (Saeki's L, R) defining at least a first control state and a second control state; a plurality of mixed-signal outputs (outputs of Saeki's inverters) each characterized by a

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respective on state (high), a respective off state (low), and a respective analog range (transition time between high and low); a set of circuit elements (inverters 21 and 22) connected to cause sequential transitions of any mixed-signal output that is in a respective off state or in the respective analog range towards a respective on state during the first control state, and to cause sequential transitions of any mixed-signal output that is in a respective on state or in the respective analog range towards a respective off state during the second control state.

As to claim 34, the modified Iwamoto's figures 4 and 5 show that the on states are all logic high and the off states are all logic low.

As to claim 35, the modified Iwamoto's figures 4 and 5 show that the on states alternate between being logic high and logic low, and the off states alternate between being logic low and logic high.

As to claim 36, the modified Iwamoto's figures 4 and 5 show a method for dynamically determining if a particular output of a set of mixed-signal outputs representing a mixed signal code is outputting an analog value, the method comprising: receiving at least one neighboring mixed-signal outputs (by Saeki's inverters 21 and 22); determining (generates out base on the value input) if the neighboring mixed-signal outputs are consistent with the particularity mixed-signal output being an analog value for the mixed-signal code (any code).

As to claim 37, the modified Iwamoto's figures 4 and 5 show that the mixed-signal code is a thermometer code.

As to claim 38, the modified Iwamoto's figures 4 and 5 show the step of dynamically connecting at least one additional capacitance (any element, i.e. circuit 43 has capacitance) or filter stage to the mixed-signal outputs that are outputting analog value.

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3. Claims 14 -16, 27-29, 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwamoto (US 20020043996), previously cited, in view of Saeki et al. (JP 57050391) and Matsuda et al. (USP 5761134).

As to claim 14, the modified Iwamoto's figures 4 and 5 do not show circuitry for maintaining an approximate state of the mixed-signal outputs. However, Matsuda's figure 5 shows a latch circuit 4 coupled to the output of tri-state inverter 2 in order to maintain an approximate state of its output. Therefore, it would have been obvious to one having ordinary skill in the art to add latch circuit to the output of each of Saeki et al.'s inverters for the purpose of maintaining the inverters' outputs when disabled.

As to claim 15, the further modified Iwamoto's figures 4 and 5 show at least one state (the added latch) maintaining element for maintaining an approximate state of the mixed-signal outputs upon power down or idle modes of the circuit; circuitry (Iwamoto's 43) to dynamically connect the at least one state maintaining element to the mixed-signal outputs determined to be outputting analog values.

As to claim 16, the further modified Iwamoto's figures 4 and 5 show that the circuitry for maintaining the approximate state of the mixed signal-outputs which maintains a reduced number of states from which the entire approximate state can be deduced.

Claims 27-29 and 39 recite similar limitations of claims above. Therefore, they are rejected for the same reasons.

As to claim 40, the modified Iwamoto's figures 4 and 5 show a method for processing a set of mixed-signal outputs, each mixed signal output characterized by a digital state and an analog state, the method comprising: detecting (by the latch and Saeki's inverters 21 and 22) when a particular mixed-signal output has reached a digital state; upon detecting that a

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particular mixed-signal output has reached the digital state, securing the particular mixed-signal output to an appropriate reference.

As to claim 41, the modified Iwamoto's figures 4 and 5 show that the set of mixed-signal outputs represent a mixed-signal code, and wherein detecting when a particular mixed-signal output has reached a digital state comprises: receiving at least one neighboring mixed-signal outputs (by the latch and inverters 21 and 22); determining if the neighboring mixed-signal outputs are consistent with the particular mixed-signal output being a digital state for the mixed-signal code (by generating outputs in response to the inverters' input).

4. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwamoto (US 20020043996), previously cited, in view of Saeki et al. (JP 57050391) and Iwamoto et al. (USP 5946268), previously cited.

The modified Iwamoto's figures 4 and 5 fails to show an LC oscillator. However, Iwamoto et al.'s figure 2 shows a similar shift register that is used to control an LC oscillator (the wire has inductance). Therefore, it would have been obvious to one having ordinary skill in the art to use the modified Iwamoto's shift register to control an LC oscillator for the purpose of saving space.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to QUAN TRA whose telephone number is (571)272-1755. The examiner can normally be reached on 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew N. Richards can be reached on (571) 272-1736. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/QUAN TRA/
Primary Examiner
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